REMARKS

An excess claim fee payment letter is submitted herewith for twenty-four (24) additional total claims and two (2) additional independent claims.

Claims 1-55 are all the claims presently pending in the application. Claims 1-3, 19, and 30 are amended to more clearly define the invention and claims 32-55 are added. Claims 1-3, 18-20, 38, and 53 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claims 1-4, 9 and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Hayes et al. reference. Claims 18-22, 25 and 28-29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Webster et al. reference. Claims 5-6, 10 and 14-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hayes et al. reference in view of the Webster et al. reference. Claims 7-8, 11-12 and 16-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hayes et al. reference in view of the Shirai reference. Claims 23-24, 26-27 and 30-31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Webster et al. reference in view of the Shirai reference.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

A first exemplary embodiment of the claimed invention, as defined by, for example,

independent claim 1, is directed to an electric bed that includes a back bottom, a knee bottom, a first drive section for rocking the back bottom up and down, a second drive section for rocking the knee bottom up and down, and a control section which controls the first drive section and said second drive section in such a way that a back angle α that is a lift-up angle of the back bottom from a horizontal state and a knee angle β that is a lift-up angle of the knee bottom from a horizontal state change along a preset pattern. The control section has a storage section for storing a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in (α, β) coordinates by a plurality of points and an operation section for controlling the first drive section and the second drive section in such a way that the back angle α and the knee angle β change along the pattern. The pattern includes at least the coordinate point (α_0, β_0).

A second exemplary embodiment of the claimed invention, as defined by, for example, independent claim 18, is directed to an electric bed that includes a back bottom, a knee bottom, a first drive section for rocking the back bottom up and down, a second drive section for rocking the knee bottom up and down, and a control section which controls the first drive section and the second drive section in such a way that a back angle α that is a lift-up angle of the back bottom from a horizontal state and a knee angle β that is a lift-up angle of the knee bottom from a horizontal state change along a preset pattern, and which has a storage section for segmenting (α, β) coordinates into a plurality of areas by taking, as a reference, a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in the (α, β) coordinates by a plurality of points and storing operational

modes of the back bottom and the knee bottom for each area, and an operation section for determining in which one of the areas the back bottom and the knee bottom are located and controlling the first drive section and the second drive section based on the operational modes of that determined area.

Conventional electric beds shift the body of the patient or applies pressure to the patient when the bed is operated to move the back and/or knee. This shifting of the patient causes a deviation between the muscles and the skin of the patient which tends to extend the blood vessels which may cause blockage and/or interruption in the circulation of blood. This, in turn, may damage the patient's skin.

Additionally, the shifting of the patient may put a significant burden on the caregiver to return the patient to the proper position.

In order to try to avoid the shifting of the patient, caregivers who use these conventional electric beds, have had to incrementally operate the back and knee moving portions under manual control. However, this requires great skill on the part of the caregiver in order to successfully prevent the patient from shifting.

The present invention addresses these problems by providing in a first exemplary embodiment an electric bed, apparatus and control method for the electric bed which controls the angles of the back and knee portions of the bed according to a stored pattern that includes at least a coordinate point (α_0, β_0) and in a second exemplary embodiment by providing an electric bed, apparatus and control method for the electric bed in which a storage section for segmenting (α, β) coordinates into a plurality of areas by taking, as a reference, a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in

the (α, β) coordinates by a plurality of points and storing operational modes of the back bottom and the knee bottom for each area, and an operation section for determining in which one of the areas the back bottom and the knee bottom are located and controlling the first drive section and the second drive section based on the operational modes of that determined area.

In this manner, the present invention reliably reduces the slipping of a patient on a bed, regardless of a subjective judgment by an operator/caregiver, at the time of rotating the back of the bed and further reduces pressure that may be applied to the abdominal and/or chest region of a patient. (Page 3, lines 12-23).

II. THE PRIOR ART REJECTIONS

A. The Hayes et al. reference

Regarding the rejection of claims 1-4, 9, and 13, the Examiner alleges that the Hayes et al. reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Hayes et al. reference.

The features of the present invention are a construction in which control for lifting the back bottom and the knee bottom up and down is actuated in accordance with patterns using a coordinate system (α, β). Namely, lifting-up and -down of the back bottom and the knee bottom are controlled along the predetermined optimal pattern of the back and knee lifting up and down angles (α, β) (see, for example, claim 1 and so on). The locus of the back and knee lifting up and down operations are preferably detected by movement distances of actuators, for example, and a construction in which, in addition to that construction, a control is carried

out by dividing the coordinate system (α, β) into a plurality of areas (see, for example, claim 18 and so on).

However, in stark contrast, the Hayes et al. reference explains that the back and knee are simultaneously operated in proportion to each other, the lifting-up rate of the back bottom is faster than the lifting-up rate of the knee bottom, and the back and knee bottom lifting up angles are detected by sensors installed at the back and knee.

As described above, a feature of controlling the sequence of motions of lifting the back bottom and the knee bottom up and down along the optimal pattern of the coordinate system (α, β) is not disclosed by the Hayes et al. reference. Therefore, the present invention has novelty and is non-obvious over the Hayes et al. reference.

According to the present invention, by controlling the sequence of motions of lifting the back bottom and the knee bottom up and down along the optimal pattern of the coordinate system (α, β), the lifting-up and -down operations of the back bottom and the knee bottom can be actuated by a pattern of the optimal coordinate system (α, β) at all times regardless of the subjectivity of an operator. Thus, it is possible to prevent a person to be care for from being subjected to decubitus and compression around the abdomen and thorax without fail, ad such an effect can be brought about, by which the burden and load of a person to be cared for and a care-giver can be reduced.

For the Examiner's convenience, a catalog that illustrates an exemplary embodiment of the present invention and the advantages associated with the present invention is enclosed.

With respect to the Examiner's rejection, the Examiner's alleged significance of the Hayes et al. reference is murky, at best, as the Office Action did not explain the pertinence of these references to the specific elements which are recited by the claims being rejected, as

required by M.P.E.P. § 707.5. The Examiner's statement completely fails to address the features of the invention which are recited by the claims.

The Examiner's rejection also fails to comply with 37 C.F.R. §1.104(c)(2) which requires that "the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified." In this case, the Examiner has failed to clearly explain the pertinence of the Hayes et al. reference to each rejected claim.

To assist Applicants' understanding, Applicants hereby respectfully request that the Examiner comply with the requirements of M.P.E.P. § 707.05 by explaining in detail the correspondence between the specific features recited by claims 1-2 and 7-8 and the particular portions of the Hayes et al. reference.

Note that MPEP § 707.05 states:

> "During the examination of an application or reexamination of a patent, the examiner should cite appropriate prior art which is nearest to the subject matter defined in the claims. When such prior art is cited, its pertinence should be explained"

To further the prosecution of this application, however, Applicants have closely reviewed the Hayes et al. reference to address the clear differences between the Hayes et al. reference and the claims.

The Hayes et al. reference does not teach or suggest the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims. As explained above, this feature is important for reducing the amount that a patient slips on the bed, regardless of a subjective judgment by an

operator/caregiver, at the time of rotating the back of the bed and reducing the pressure that is applied to the abdominal and/or chest region of the patient.

Rather, the Hayes et al. reference merely discloses a hospital bed that includes a central proportional control box 24 with a microprocessor M that controls the proportional movement of a third actuator (backrest angle control) with respect to a fourth actuator (legrest angle control). Specifically, the controller that is disclosed by the Hayes et al. reference controls these actuators so that "each backrest adjustment brings about a similar but smaller legrest adjustment." (Col. 4, lines 8-16). The Hayes et al. reference discloses that "operation of a first motor automatically causes a proportionate operation of the second motor in a like direction." (Emphasis added, col. 1, lines 29-35).

In other words, the Hayes et al. reference discloses controlling the motion of the backrest and the legrest such that the motions are proportional to each other.

The Hayes et al. reference does not teach or suggest controlling the backrest and the legrest in accordance with the claimed invention.

As explained above, the present invention controls the back and the knee sections of the bed such that the angles of these sections follow a stored pattern that includes at least a coordinate point (α_0, β_0).

Indeed, the Examiner admits that the Hayes et al. reference "do (sic) not specifically disclose a condition wherein the start signals of a back lift-up operation and of a back lift-down operation respectively output a stop request, lift-up operation, or lift-down operation according to the lift-up and lift-down patterns of a specific back angle and a specific knee angle." (Page 3, Office Action).

Clearly, the Hayes et al. reference does not teach or suggest storing any pattern that

includes any coordinate points at all.

Therefore, the Hayes et al. reference does not teach or suggest each and every element of the claimed invention and the Examiner is respectfully requested to withdraw this rejection of claims 1-4, 9, and 13.

B. The Webster et al. reference

Regarding the rejection of claims 18-22, 25, and 28-29, the Examiner alleges that the Webster et al. reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Webster et al. reference.

As explained above, the features of the present invention are a construction in which control for lifting the back bottom and the knee bottom up and down is actuated in accordance with patterns using a coordinate system (α, β). Namely, lifting-up and -down of the back bottom and the knee bottom are controlled along the predetermined optimal pattern of the back and knee lifting up and down angles (α, β) (see, for example, claim 1 and so on). The locus of the back and knee lifting up and down operations are preferably detected by movement distances of actuators, for example, and a construction in which, in addition to that construction, a control is carried out by dividing the coordinate system (α, β) into a plurality of areas (see, for example, claim 18 and so on).

However, in stark contrast, the Webster et al. reference explains that the back and knee lifting up and down operations are controlled so that the back and knee angles do not become smaller than a predetermined angle (such as, for example, 90 degrees), and the back and knee angles are controlled by detecting the angles of the back and knee angles by means

of sensors.

As described above, a feature of controlling the sequence of motions of lifting the back bottom and the knee bottom up and down along the optimal pattern of the coordinate system (α, β) is not disclosed by the Webster et al. reference. Therefore, the present invention has novelty and is non-obvious over the Webster et al. reference.

According to the present invention, by controlling the sequence of motions of lifting the back bottom and the knee bottom up and down along the optimal pattern of the coordinate system (α, β), the lifting-up and -down operations of the back bottom and the knee bottom can be actuated by a pattern of the optimal coordinate system (α, β) at all times regardless of the subjectivity of an operator. Thus, it is possible to prevent a person to be care for from being subjected to decubitus and compression around the abdomen and thorax without fail, ad such an effect can be brought about, by which the burden and load of a person to be cared for and a care-giver can be reduced.

Regarding the Examiner's rejection, the Examiner's alleged significance of the Webster et al. reference is murky, at best, as the Office Action did not explain the pertinence of these references to the specific elements which are recited by the claims being rejected, as required by M.P.E.P. § 707.5. The Examiner's statement completely fails to address the features of the invention which are recited by the claims.

The Examiner's rejection also fails to comply with 37 C.F.R. §1.104(c)(2) which requires that "the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified." In this case, the Examiner has failed to clearly explain the pertinence of the Webster et al. reference to each rejected claim.

To assist Applicants' understanding, Applicants hereby respectfully request that the Examiner comply with the requirements of M.P.E.P. § 707.05 by explaining in detail the correspondence between the specific features recited by claims 1-2 and 7-8 and the particular portions of the Webster et al. reference.

Note that MPEP § 707.05 states:

> "During the examination of an application or reexamination of a patent, the examiner should cite appropriate prior art which is nearest to the subject matter defined in the claims. When such prior art is cited, its pertinence should be explained"

To further the prosecution of this application, however, Applicants have closely reviewed the Webster et al. reference to address the clear differences between the Webster et al. reference and the claims.

The Webster et al. reference does not teach or suggest the features of the claimed invention including: a storage section for segmenting (α, β) coordinates into a plurality of areas by taking, as a reference, a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in the (α, β) coordinates by a plurality of points and storing operational modes of the back bottom and the knee bottom for each area, and an operation section for determining in which one of the areas the back bottom and the knee bottom are located and controlling the first drive section and the second drive section based on the operational modes of that determined area. As explained above, these features are important for reducing the amount that a patient slips on a bed, regardless of a subjective judgment by an operator/caregiver, at the time of rotating the back of the bed and reducing

pressure that may be applied to the abdominal and/or chest region of a patient.

Rather, the Webster et al. reference merely discloses a stretcher having a movable head section 44, a movable thigh section 48, and a control system 208. "The control system 208 is configured so that once back-to-thigh angle 84 reaches a predetermined minimum angle, patient control buttons 78 cannot be used to move head and thigh sections 44, 48 to a position where back-to-thigh angle 84 is less than the predetermined minimum angle." (Col. 8, lines 47-53). The Webster et al. reference also discloses allowing the caregiver the ability to move the head section 44 to a position having back-to-thigh angle 84 less than the predetermined angle. (Col. 8, line 64 - col. 9, line 2).

In other words, the Webster et al. reference discloses a stretcher that prevents a patient from arranging the head section 44 and the thigh section 48 such that they have an angle between them which is less than a predetermined minimum angle. Thus, the Webster et al. reference merely discloses a control system which prevents movement past a limit.

Indeed, the Webster et al. reference is subject to the same problems which are solved by the present invention. The stretcher that is disclosed by the Webster et al. reference merely discloses controlling the head and thigh sections such that they do not form an angle which is less than a predetermined angle. The stretcher that is disclosed by the Webster et al. reference allows the body of the patient to shift such that it applies pressure to the patient when the stretcher is operated to move the back and/or knee. This shifting of the patient causes a deviation between the muscles and the skin of the patient which tends to extend the blood vessels which may cause blockage and/or interruption in the circulation of blood. This, in turn, may damage the patient's skin.

Additionally, the shifting of the patient on the stretcher disclosed by the Webster et al.

reference may put a significant burden on the caregiver to return the patient to the proper position.

Thus, a caregiver who uses the stretcher that is disclosed by the Webster et al. reference must incrementally operate the back and knee moving portions under manual control. However, this requires great skill on the part of the caregiver in order to successfully prevent the patient from shifting on the stretcher.

In stark contrast, the present invention provides an electric bed, apparatus and control method for the electric bed which controls the angles of the back and knee portions of the bed using a storage section that segments (α, β) coordinates into a plurality of areas by taking, as a reference, a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in the (α, β) coordinates by a plurality of points and storing operational modes of the back bottom and the knee bottom for each area, and an operation section for determining in which one of the areas the back bottom and the knee bottom are located and controlling the first drive section and the second drive section based on the operational modes of that determined area.

Clearly, the stretcher that is disclosed by the Webster et al. reference does not address the problems that are solved by the present invention.

Indeed, the Webster et al. reference does not teach or suggest anything at all about a storage section that segments anything at all, let alone that segments (α, β) coordinates into a plurality of areas, or that segments (α, β) coordinates in a plurality of areas using a pattern connecting between a coordinate point (0, 0) a coordinate point (α_0, β_0) as recited by independent claims 18-20.

Further, the Webster et al. reference also does not teach or suggest an operation section that determines in which one of the areas the back and knee bottoms are located, let alone controlling the drive sections based upon the operational modes of the determined area.

Therefore, the Webster et al. reference does not teach or suggest each and every element of the claimed invention and the Examiner is respectfully requested to withdraw this rejection of claims 18-22, 25, and 28-29.

C. The Hayes et al. reference in view of the Webster et al. reference

Regarding the rejection of claims 5-6, 10, and 14-15, the Examiner alleges that the Webster et al. reference would have been combined with the Hayes et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different and unrelated matters and problems.

Specifically, the Hayes et al. reference is directed to providing an electric bed having a controller that ensures that operation of a first motor causes a proportionate operation of a second motor in a like direction. (Col. 1, lines 29-35).

In stark contrast, the Webster et al. reference is specifically directed to providing a stretcher having a drive mechanism that includes both mechanized and hand operated drives (col. 1, lines 31-34, and col. 2, lines 20-25).

One of ordinary skill who was concerned with providing an electric bed having a

controller that ensures that operation of a first motor causes a proportionate operation of a second motor in a like direction as the Hayes et al. reference is concerned with providing would not have referred to the Webster et al. reference, and vice-versa, because the Webster et al. reference is concerned with the completely different and unrelated problem of providing a stretcher having a drive mechanism that includes both mechanized and hand operated drives.

Indeed, the Webster et al. reference does not teach or suggest an electric bed at all, rather, the Webster et al. reference clearly acknowledges that there are differences between an electric bed and a stretcher and that the object of the Webster et al. reference is to provide a stretcher.

Thus, the references would not have been combined, absent hindsight.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As very clearly explained above, neither of the Hayes et al. reference nor the Webster et al. reference teach or suggest the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims. As explained above, this feature is important for reducing the amount that a patient slips on the bed, regardless of a subjective judgment by an operator/caregiver, at the time of rotating the back of the bed and reducing the pressure that is applied to the abdominal and./or chest region of the patient.

The Examiner admits that the Hayes et al. reference "do (sic) not specifically disclose a condition wherein the start signals of a back lift-up operation and of a back lift-down

operation respectively output a stop request, lift-up operation, or lift-down operation according to the lift-up and lift-down patterns of a specific back angle and a specific knee angle." (Page 3, Office Action).

However, the Examiner alleges that "Webster et al. '076 provides the basic teaching of an electric bed (30) comprising a back bottom (44) and a knee bottom (48 which are respectively moved between raised and lowered positions by first and second drive sections (142, 144), wherein the back and knee bottom sections are either stopped, lifted up, or lowered by a control section (234) according to a plurality of preset angles." (Emphasis added).

Contrary to the Examiner's allegations, the Webster et al. reference does not disclose a stretcher having a control section that either stops, lifts up or lowers according to a plurality of preset angles, let alone disclose the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims.

Rather, the Webster et al. reference discloses locking out patient controls according to whether a lockout switch is set (see, for example, step 563 in Fig. 28), or whether the head angle is greater than predetermined limits (see, for example, limit 3 in step 565, limit 2 in step 568, and limit 1 in step 572 in Fig. 28).

In other words, the Webster et al. reference merely discloses locking out the patient's controls according to whether a caregiver has locked out the patient or whether the angle of the head section exceeds any of a series of predetermined angle limits.

Indeed, the Webster et al. reference does not teach or suggest anything at all about coordinating the motion of the sections of the stretcher at all, let alone controlling the motion of the head and thigh sections, controlling the motion of the head and thigh sections such that

their angles change along a pattern, or controlling the motion of the head and thigh sections such that their angles change along a pattern that includes at least a coordinate point (α_0, β_0).

Clearly, the Webster et al. reference does not remedy the deficiencies of the Hayes et al. reference.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 5-6, 10, and 14-15.

D. The Hayes et al. reference in view of the Shirai reference

Regarding the rejection of claims 7-8, 11-12, and 16-17, the Examiner alleges that the Shirai reference would have been combined with the Hayes et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different and unrelated matters and problems.

Specifically, the Hayes et al. reference is directed to providing an electric bed having a controller that ensures that operation of a first motor causes a proportionate operation of a second motor in a like direction. (Col. 1, lines 29-35).

In stark contrast, the Shirai reference is specifically directed to providing a bottom structure for a bed, which can be bent in appropriate curves to provide gentle curvature at the bent portions of the bed so as to minimize any displeasing pressure points for the patient. (Col. 1, lines 36-43).

One of ordinary skill who was concerned with providing an electric bed having a controller that ensures that operation of a first motor causes a proportionate operation of a second motor in a like direction as the Hayes et al. reference is concerned with providing would not have referred to the Shirai reference, and vice-versa, because the Shirai reference is concerned with the completely different and unrelated problem of providing a bottom structure for a bed, which can be bent in appropriate curves to provide gentle curvature at the bent portions of the bed so as to minimize any displeasing pressure points for the patient.

Thus, the references would not have been combined, absent hindsight.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, the Hayes et al. reference does not teach or suggest the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims.

Indeed, the Examiner admits that the Hayes et al. reference "do (sic) not specifically disclose a condition wherein the start signals of a back lift-up operation and of a back lift-down operation respectively output a stop request, lift-up operation, or lift-down operation according to the lift-up and lift-down patterns of a specific back angle and a specific knee angle." (Page 3, Office Action).

The Shirai reference does not remedy the deficiencies of the Hayes et al. reference. Indeed, the Examiner does not allege that the Shirai reference teaches or suggests the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 7-8, 11-12, and 16-17.

E. The Webster et al. reference in view of the Shirai reference

Regarding the rejection of claims 23-24, 26-27, and 30-31, the Examiner alleges that the Shirai reference would have been combined with the Webster et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Webster et al. reference is directed to providing a stretcher having a drive mechanism that includes both mechanized and hand operated drives (col. 1, lines 31-34, and col. 2, lines 20-25).

In stark contrast, the Shirai reference is directed to providing a bottom structure for a bed, which can be bent in appropriate curves to provide gentle curvature at the bent portions of the bed so as to minimize any displeasing pressure points for the patient. (Col. 1, lines 36-43).

One of ordinary skill who was concerned with providing a stretcher having a drive mechanism that includes both mechanized and hand operated drives as the Webster et al. reference is concerned with providing would not have referred to the Shirai reference, and vice-versa, because the Shirai reference is concerned with the completely different and

unrelated problem of providing a bottom structure for a bed, which can be bent in appropriate curves to provide gentle curvature at the bent portions of the bed so as to minimize any displeasing pressure points for the patient.

Thus, the references would not have been combined, absent hindsight.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, the Webster et al. reference does not teach or suggest the features of the claimed invention including a storage section for segmenting (α, β) coordinates into a plurality of areas by taking, as a reference, a pattern connecting between a coordinate point (0, 0) at which each of the back bottom and the knee bottom is horizontal and a coordinate point (α_0, β_0) at which the back bottom is lifted up in the (α, β) coordinates by a plurality of points and storing operational modes of the back bottom and the knee bottom for each area, and an operation section for determining in which one of the areas the back bottom and the knee bottom are located and controlling the first drive section and the second drive section based on the operational modes of that determined area as recited by, for example, independent claim 18.

Indeed, the Webster et al. reference does not teach or suggest anything at all about a storage section that segments anything at all, let alone that segments (α, β) coordinates into a plurality of areas, or that segments (α, β) coordinates in a plurality of areas using a pattern connecting between a coordinate point (0, 0) a coordinate point (α_0, β_0) as recited by independent claims 18-20.

Further, the Webster et al. reference also does not teach or suggest an operation

section that determines in which one of the areas the back and knee bottoms are located, let alone controlling the drive sections based upon the operational modes of the determined area.

The Shirai reference does not remedy the deficiencies of the Webster et al. reference. Indeed, the Examiner does not allege that the Shirai reference teaches or suggests the features of the claimed invention including storing a pattern that includes at least a coordinate point (α_0, β_0) as recited by the independent claims.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 23-24, 26-27, and 30-31.

III. FORMAL MATTERS AND CONCLUSION

The Office Action objects to claim 31 as reciting the same features of claim 30. In this regard, this Amendment amends claim 30. Therefore, claims 30 and 31 do not recite the same features. Applicants respectfully request withdrawal of this objection.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-55, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 3/9/05

James E. Howard
Registration No. 39,715

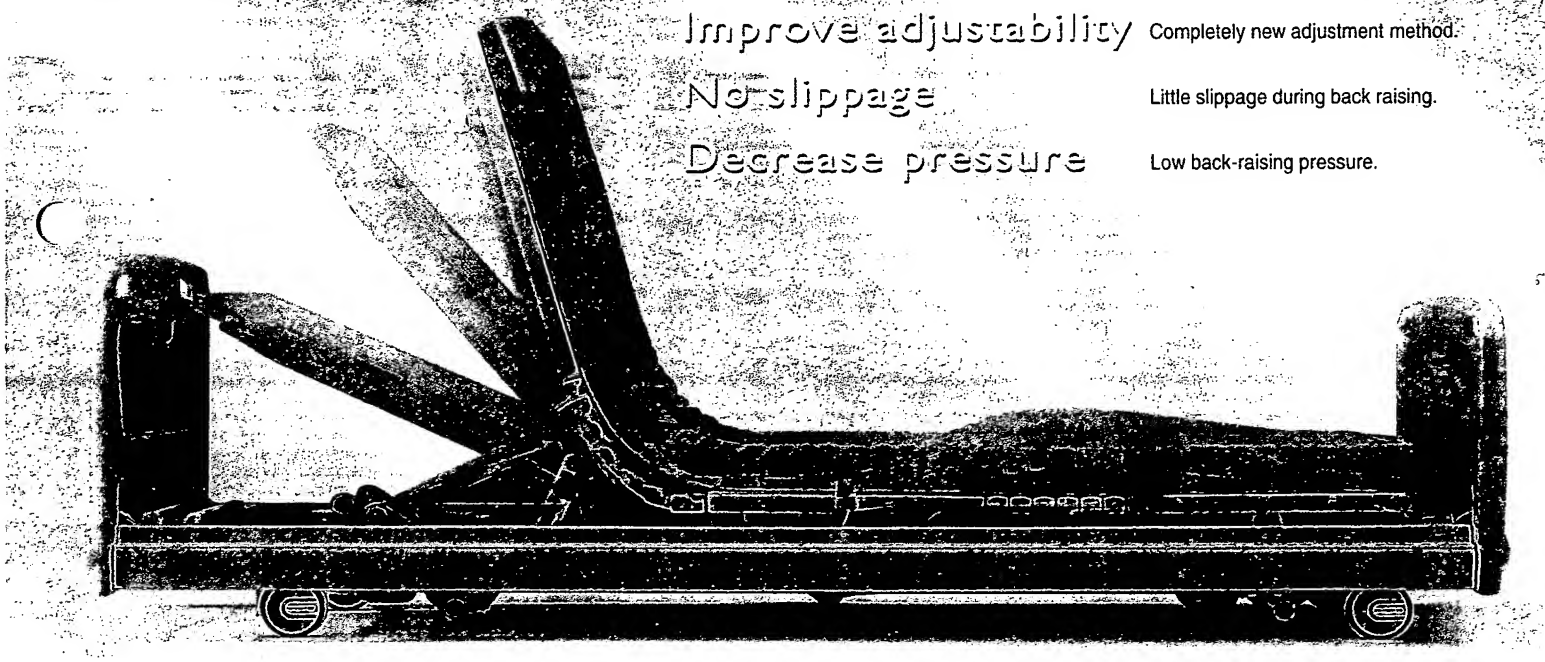
McGinn & Gibb, PLLC
8321 Old Courthouse Rd., Suite 200
Vienna, Virginia 22182
(703) 761-4100
Customer No. 21254

PARAMOUNT BED

Corroborative facts 1

KIND motion

Keep good posture	Maintains good posture.
Improve adjustability	Completely new adjustment method.
No slippage	Little slippage during back raising.
Decrease pressure	Low back-raising pressure.



■ Increased patient safety and bedsore prevention

Use the Matis Bed and peripheral equipment to provide a safer treatment environment for patients with improved prevention of bedsores.

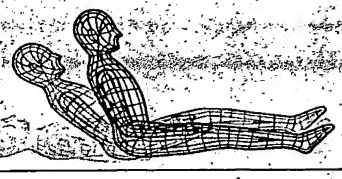
■ Easier dismounting at earlier stages

KINDmotion provides patients with higher levels of independence. An upward sitting position can be readily achieved, and furthermore, posture can be maintained and a standing position can be achieved with ease.

■ More efficient nursing operations

With little slippage during back raising, the effort required to return patients to their original positions can be eliminated; accordingly, nurse fatigue and lower-back problems can be alleviated.

Paramount Bed's New Solutions for Medical Facilities



Matis Bed Catalog

Applicant : Paramount Bed Co., Ltd.
Inventor : Hiroshi Nagaoka
Date : January 31. 2005

KIND motion + a low 25-cm height represent a new standard for medical facility beds

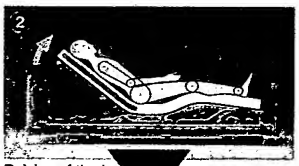
- Back raising results in less loss of posture, slippage, and back pressure.
- A single button is used to carry out specially programed back raising, thus allowing the patient to raise even by himself of herself to a seated position unassisted.
- In order to ensure comfortable back raising, KINDmotion operation is possible from any bed position.
- Both long-sitting and side-sitting positions can be easily achieved, thus providing the patient with higher levels of ADL and QOL.

World's First

By combining the comfortable stretching and bending made possible by **Kyma Line** with an ergonomic **elevation control** system, we have perfected an back raising technique that results in less **loss of posture**, **slippage**, and **back pressure**.

KINDmotion back raising

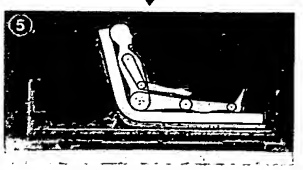
Raising starts at the knees in order to prevent slippage.



Raising of the back

In order to prevent increase of back pressure during back raising, the knees are lowered at the same time.

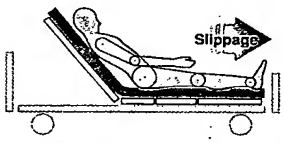
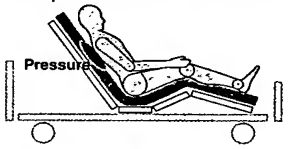
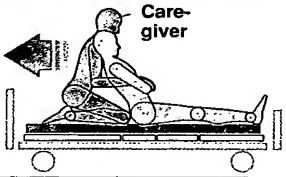
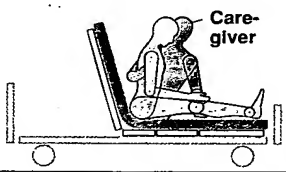
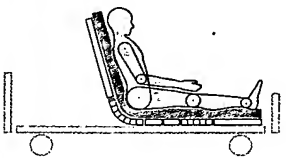
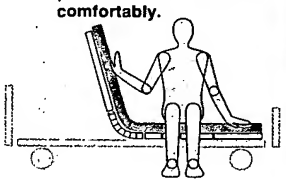
Raising of the back



A comfortable long-sitting position is achieved.

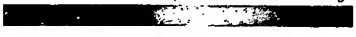
*: A different process is used for lowering.

Comparison with Conventional Approach

	Slippage	Loss of posture	Feeling of pressure in back
4-plate base	Slippage and loss of posture occur as a result of back raising. 		Although loss of posture is prevented when the back and knees are raised simultaneously, more pressure is felt in the back. 
	The patient slips towards the bottom of the bed as a result of back raising and must be returned to the original position. 	The patient's posture must be fixed. 	Pressure distribution  Basic auto contour A large amount of force (red) is applied to the lower body and back.
Kyma Line	KINDmotion further advances the improvements made with Kyma Line.		Pressure distribution  Kyma Line and auto contour
KIND motion	With little slippage, a long-sitting position can be achieved comfortably. 	With little loss of posture, a long-sitting position and side-sitting comfortable positions can be achieved comfortably. 	Pressure distribution  Kind motion As no excessive force is applied in order to support the patient, even less pressure is felt in the back.

*: Pressure distribution charts show data for a 172-cm, 52-kg patient. After raising the base from 0° to 75°, measurements were taken at 75°(; furthermore, said measurements were taken using unique Paramount Bed methods.)

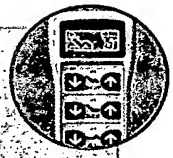
Low ⟵ Contact pressure ⟶ High



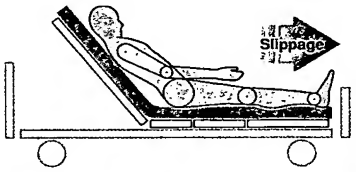
Advantages of KIND motion

If a patient is in a sleeping posture and his or her back is simply raised, the pelvis will remain in the orientation for sleeping, and as a result, pressure applied from the back will have nowhere to escape. In this way, the patient's entire body will slip towards the bottom of the bed. As a solution to this problem, KINDmotion lifts the pelvic joint and raises then raises the back so that a suitable posture can be maintained, slipping will not occur, and the feeling of pressure in the patient's back can be alleviated.

One-button operation
Use a single button on the handheld controller to benefit from all of the advantages described below. And since the patient can carry out these operations unassisted, the workload of nursing staff can be reduced.



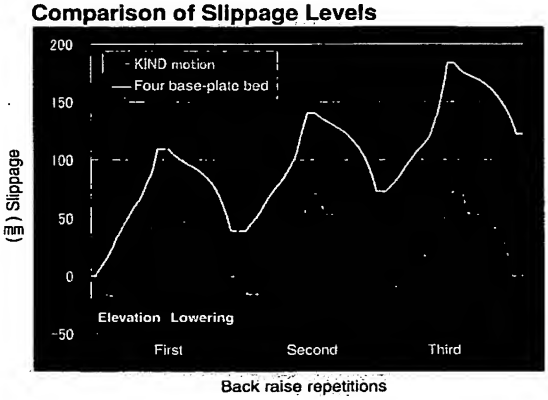
1. Reduced Slippage

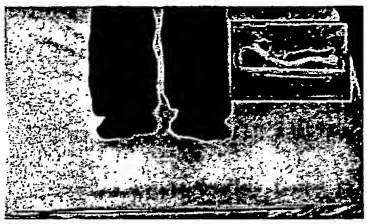


A patient who has slipped must be pulled up to the original position.

KINDmotion raises the patient's back from a sleeping position while maintaining a semi-sitting posture; accordingly, slippage towards the bottom of the bed during the back raising process is much less likely to occur.

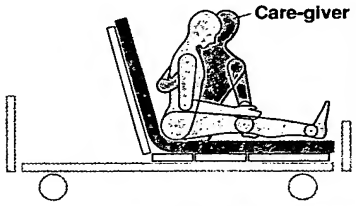
Comparison of Slippage Levels





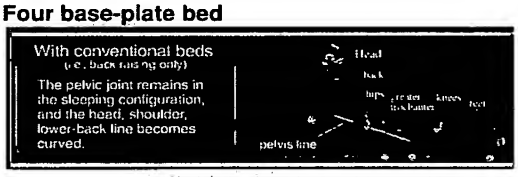
The figure on the left compares levels of slippage after a patent has been raised and lowered three times. With conventional bed designs, slippage towards the bottom of the bed occurs each time that the patient is elevated; however, KINDmotion returns to the same approximate position regardless of the number of elevations. Accordingly, the need for strenuous replacement of patients after slippage can be practically eliminated.

2. Reduced Posture Loss



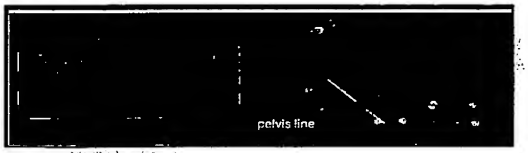
Any loss of patient posture must be rectified, and the help of the care-giver is necessary for this operation.

Four base-plate bed



With conventional beds, the head, shoulder, and lower-back line is curved.

KINDmotion

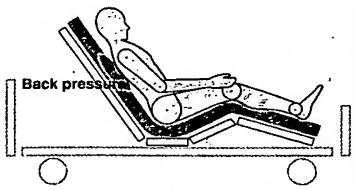


With KINDmotion, the head, shoulder, and lower-back line is lifted.

*: Bone-position measurement obtained through screen capture (Measurement of back and pelvis angles)

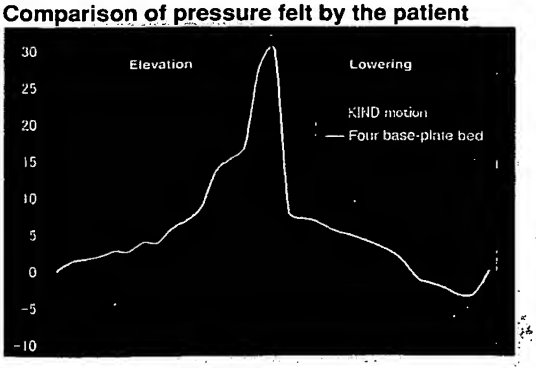
With little loss of posture, it is easier to attain a side-sitting position, and a stable side-sitting posture is the first step in standing upright.

3. Reduced Back Pressure



Raising the knees and then the back results in less slippage of the patient's entire body; however, this also increases the sense of pressure that is felt by the patient. Pressure is one of the main causes of bedsores.

Comparison of pressure felt by the patient



In contrast to standard auto contour, the patient's knees are lowered as the back is raised, thus eliminating the build up of pressure beyond that needed for body support. Accordingly, the patient feels less pressure, and this has a direct effect on the prevention of bedsores.

* Beds used for comparison: KA-4000S conventional four-plate bed, KA-9700 KINDmotion Mattress used: Preglar Patient data: 165 cm, 62 kg (Independent Paramount Bed data)

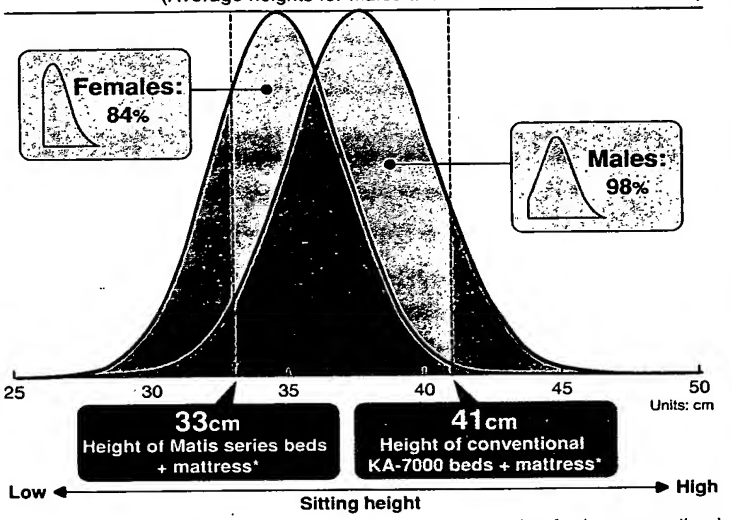
Ultra-low 25-cm height realized through concern for safety and stability

bed height **25-cm** (to scale)

A stable side-sitting position with feet firmly on the floor.

Research data shows that approximately 90% of Japanese people of sixty or older have a sitting height* of at least 33 cm (see figure on right for more details). In the case of conventional beds such as the KA-7000, the height of the bed place from the floor is 41 cm (including an 8-cm mattress), and as a result, the majority of patients could not comfortably attain a stable side-sitting position.
Matis series beds boast an extremely low height of only 25 cm, and even when a mattress is added, a bed height of 33 cm can be achieved. Thanks to this reduced height, the majority of patients can now achieve a stable side-sitting position. In addition to preventing patients with poor balance from falling while standing or relocating from the bed, this also has the advantage of promoting voluntary rehabilitation.

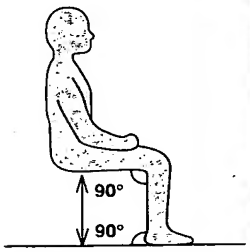
Sitting heights at which heels contact floor
(Average heights for males and females between 60 and 99)



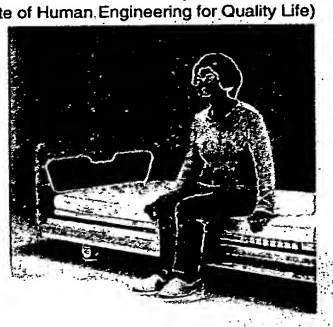
Reference material: Physical measurement data for Japanese nationals (Research Institute of Human Engineering for Quality Life)

*: Sitting height: Vertical height from ground to seat when sitting with both knee and ankle joints at approximately 90°.

Reference: Definition for physical measurement of Japanese nationals (Research Institute of Human Engineering for Quality Life)

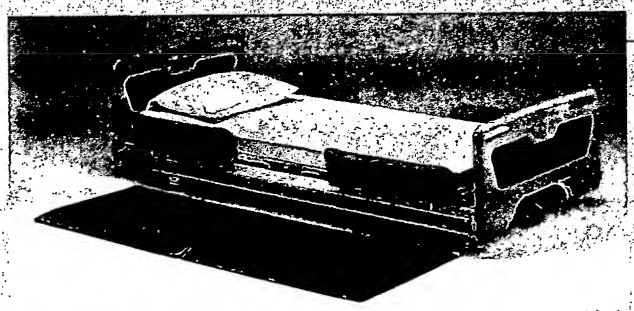


Stable side-sitting posture



Q What is side-sitting posture?

A The term "side-sitting posture" is used to refer to the shape of a person sitting on the side of a bed. In order to achieve a stable side-sitting posture, it is extremely important that both feet are in firm contact with the floor and that the buttocks are resting securely on the bed. Furthermore, whenever a patient is to move from the bed by standing or transfer, it is crucial that this be done from a stable side-sitting position.
In the ideal side-sitting posture, the hip joint and knees are at approximately the same height, both thighs are positioned fully over the mattress, and the soles of both feet are in full contact with the floor.



Less Danger of Fall Injuries

As this bed is positioned closer to the floor, the possibility of injury as a result of the patient falling or rolling off the bed can be reduced.

*: Protection can be further enhanced by adding a cushioning mat (Thestor) and side supports.

Precautions when using Thestor mats

*: The purpose of these mats is to reduce the scale of impact; accordingly, prevention of injury is not guaranteed.
*: For safety reasons, the bed should be set to the lowest position.

Effect of introducing ultra-low 25-cm beds

Freedom from excessive usage of side rails. → Promotion of voluntary rehabilitation → Improved safety

Improved Activity of Daily Living and Quality of Life

Floor

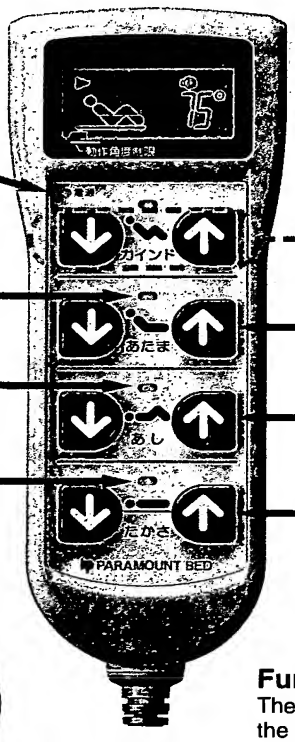
One-button operation!

KIND: The KINDmotion elevation button

- **By also controlling motion of the knees, this single button can be used for highly convenient back raising and lowering.**

Mode of Use

Press a button to move the bed, and release it to stop at the current position.



Power Indicator

On : Power is being supplied normally.

Off : The power plug or handheld-controller plug is disconnected, a power failure has occurred, or an electrical line has been severed.

Flashing:
Indicates an abnormal condition such as a severed line or an obstacle preventing motion of the bed.

Selector Indicators

On : The corresponding operation is possible.

Off : The corresponding operation is prohibited.

Flashing:
The manual operation-selector switch on the rear side is being pressed.

Control Buttons

Head : Used to raise and lower the back.

Legs : Used to raise and lower the knees.

Height : Used to raise and lower the bed for height adjustment.

This product features universal design for convenient use by everyone.

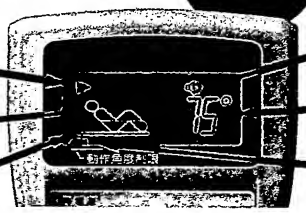
Universal Design

Universal Design is a concept aiming at convenient usage by anyone, regardless of age, ability, or environment.

Condition LCD

This back-lit LCD shows the current operating condition of the bed.

LCD type



Speed display: Normal or Fast

Direction display: Raise or Lower

Operation point display

Sound: On or Off

Angle or height display

Angle limit: On or Off

Function Lamps

These lamps light up to indicate the selected functions.

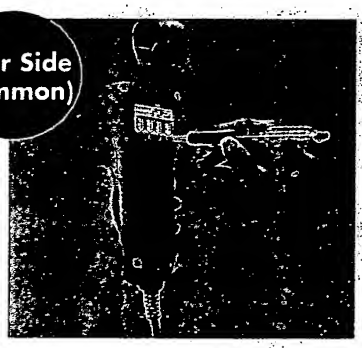
Non-LCD type

Angle limit: On or Off
Lit → On

Speed display: Normal or Fast
Lit → Fast

Sound: On or Off
Lit → On

Rear Side (common)



The following selections can be made using the switches on the rear of the handheld controller. Use a thin pen tip or the equivalent to change the switch settings.

❶ Operation Setting
This switch is used to permit or prohibit each of the bed operations using the handheld unit.

❷ Angle Limiting (On/Off)
This switch is used to turn angle limiting on or off for the under-back and under-knee sections.

❸ Speed (Normal/Fast)
This switch is used to set the speed at which the under-back section is raised or lowered.

❹ Sound (On/Off)
This switch is used to turn the handheld controller's operation sound on and off.

Handheld Controller

Universal Design

This controller can be held and operated using only one hand; furthermore, consideration has also been given to simple display and operation. The LCD type features a back-light for easy viewing at night.

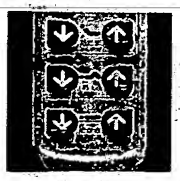
Universal Design

Operation Sound

The handheld controller can emit a beep whenever a button is pressed to allow operations to be confirmed. (In consideration of hearing ability of the elderly, a frequency of 12-kHz has been selected.)

Chemical & Water Resistant

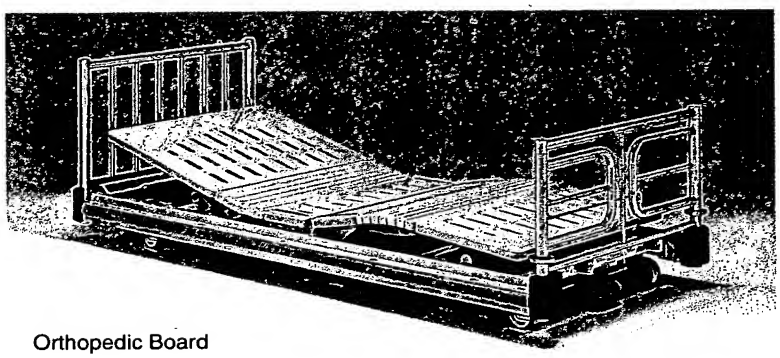
With excellent resistance to chemicals, this handheld controller is highly suitable for cleaning. Furthermore, water resistance has also been added for higher levels of peace-of-mind.



World's first Programmed Auto Contour: KINDmotion now available as an optional extra for Matis series beds.

Matis Series

Medium Oak

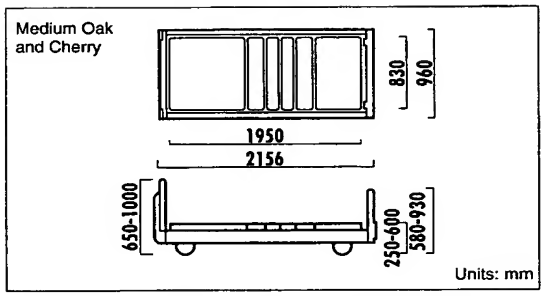


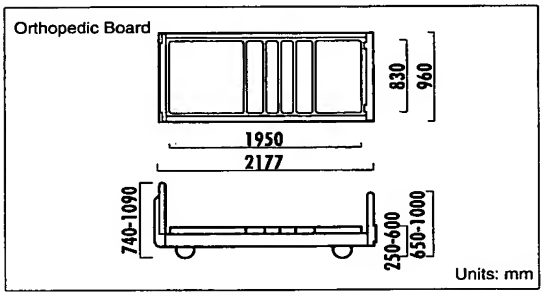
Orthopedic Board

KA-9700B

- ◆830-mm Kyma line base
- ◆Handheld controller for back raising, knee raising, and height adjustment
  - · On/off switching using handheld controller
  - · Switching of raising speed between normal and x1.5
  - · On/off switching of back-knee angle limiting
  - · On/off switching of operation sound
- ◆Central locking for 100-mm caster wheels (from Tente-Rollen GmbH & Co. of Germany)
- ◆Integrated lightweight plastic design for boards (Medium Oak and Cherry); detachable
- ◆Detachable board for orthopedic applications
- ◆Emergency handle for manual adjustment
- ◆Mattresses are sold separately

Optional extras allow upgrading to a bed with KINDmotion and an LCD hand unit.





Functional Description of Matis Series Beds

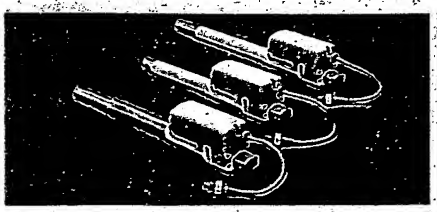
Actuators

Uniform velocity control and quiet operation

With uniform velocity control, this bed will not slow down when loaded, and a constant operation speed can be maintained. And with very little change in operating sound, the nurse or care-giver can perform all necessary operations with peace-of-mind.

Linear actuators

The Matis series features actuators that have been independently designed by Paramount Bed for medical bed applications; accordingly, they benefit from improved vibration, sound, and noise characteristics. Furthermore, low-speed control is adopted for these actuators to ensure that the weight of the patient has no effect on the raising or lowering speed.

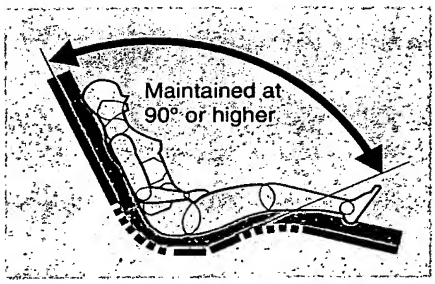


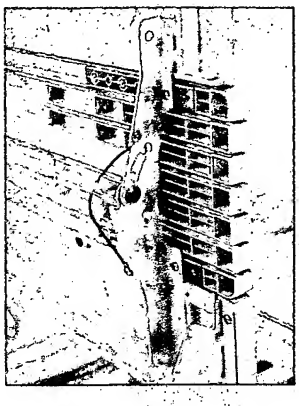
Emergency manual crank handles

In order to provide support for power outages and usage in locations with no power supply, handles can be used to manually operate the shoulder, knee, and height adjusters.

Angle limiting function

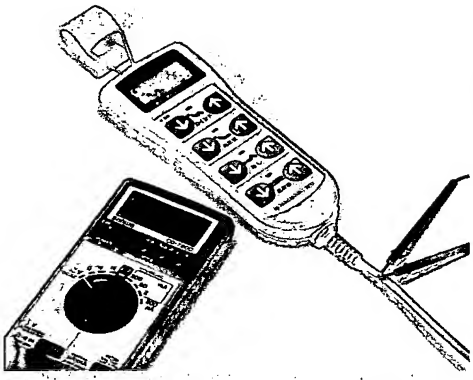
The angle between the back and knee sections is kept at 90° or higher in order to prevent the patient from experiencing any excessive pressure.





Consideration for electrical safety

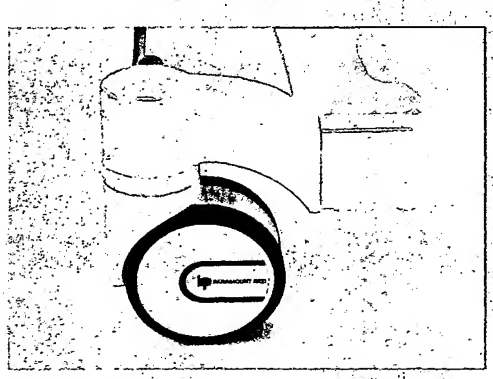
The bed's metallic frame is grounded to prevent any build-up of electricity. As this maintains the entire bed in a uniform electrical condition, the effect of noise on ME devices is also reduced.



Low-voltage handheld controller

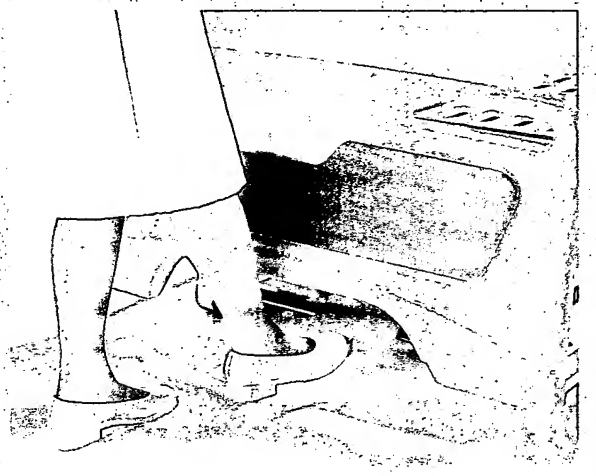
A 5-V specification has been selected to ensure safety from electrical shock in the unlikely event of the controller's cable being severed.

Central locking wheels



Caster wheels

Adopted for the first time with Matis series beds, these small double-wheels have a 100-mm diameter and allow easy relocation as afforded by 125-mm variations.

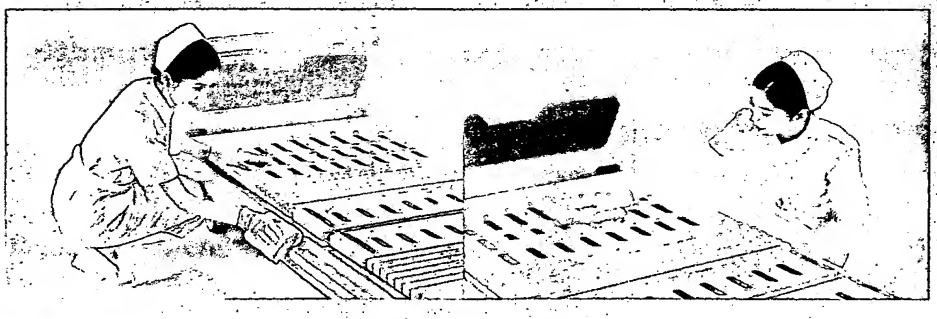


Improved wheel locking

A large pedal has been incorporated to allow easy locking. Use this single pedal to centrally lock and unlock all four caster wheels.

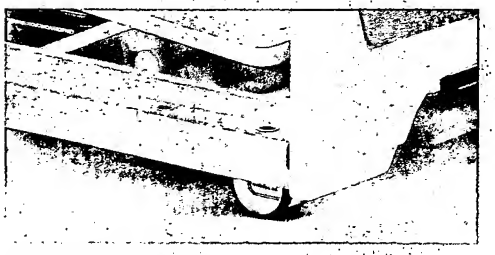
Full Host of Functions for Medical Applications

Bed



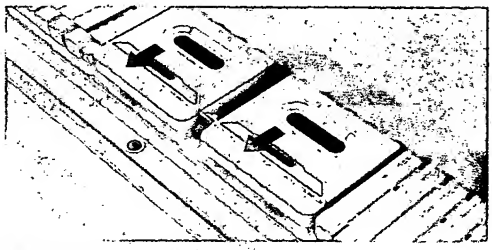
Easily-cleaned panels and frame

These press-formed components have been designed to prevent catching for more convenient cleaning operations.



Side bumpers

Installed on the sides of beds, bumpers prevent injury and damage to property when moving beds or when working in their immediate vicinity.



Mattress slide guard

These retainers hold the mattresses in place during repeated mounting, dismounting, or gatching operations.

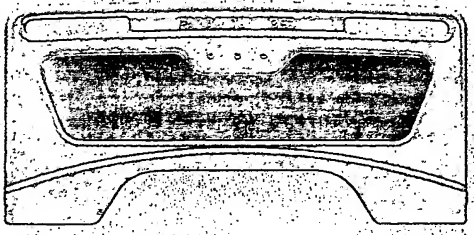
Two-stage lowering

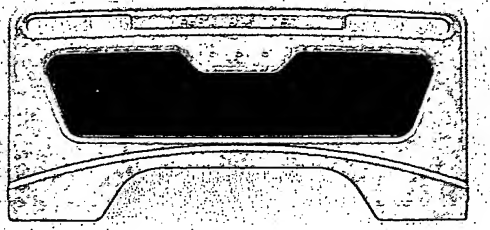
When the bed is being lowered, it will stop automatically at a height of 290 mm and an alarm beep will be sounded. When the button is again pressed, the bed will be lowered fully to the lowest position.

Compatible with 1/12 slope

Even in situations where the floor is sloped in accordance with the Act on Buildings Accessible and Usable by the Elderly and Physically Disabled, these beds can be easily moved around.

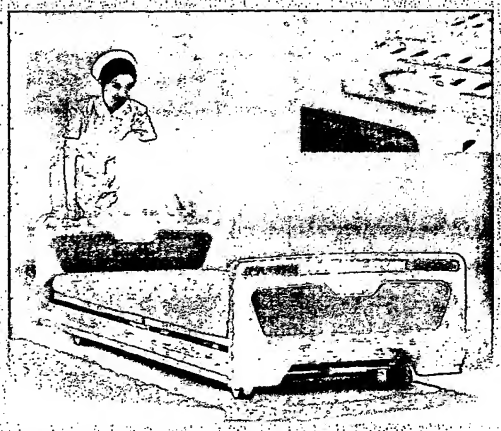
Head & Foot Boards





Easily cleaned plastic design

Featuring a flat surface with little indentation, these head and foot boards allow cleaning to be performed with ease; furthermore, they will retain their attractive appearance over a long service life. Detachable in a single operation, the boards also provide speedy support for emergency medical applications.



Grip-rail for convenient relocation

A grip rail has been incorporated into the top of the head and foot boards, and these rails can be used to comfortably move the bed with the minimum of effort. You can also use these grips when removing the head or foot board.

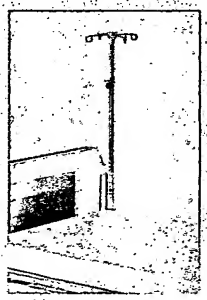
Detachable design

The head and foot boards can be easily removed from the bed so that treatment from the top or bottom of the bed can be administered more conveniently.

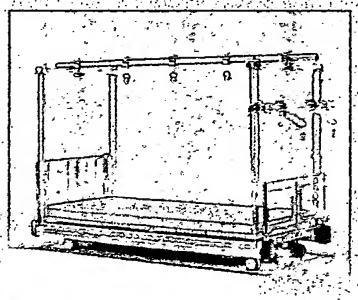
Auto-locking board stoppers

When the head and foot boards are assembled to the bed, an auto-locking mechanism operates to prevent them from being easily detached. Accordingly, the bed can be moved around with peace-of-mind, without having to worry about whether or not the board locks have been applied.

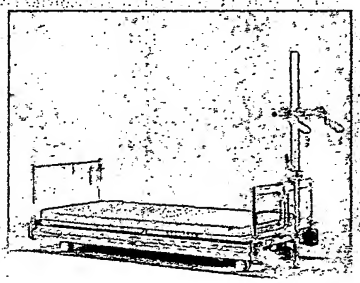
OPTIONAL EXTRAS AND COMBINATIONS



● **KC-56** IV POLE

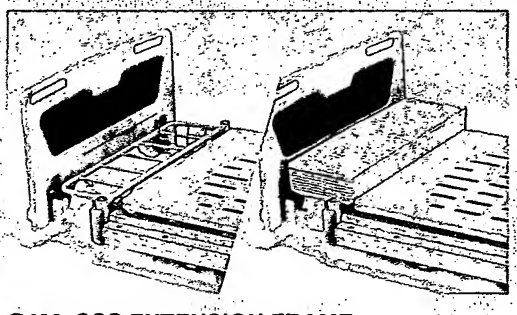


● **KA-83** TRACTION FRAME



● **KA-81** TRACTION FRAME

SUPPORT FOR EXTENSION



● **KA-082** EXTENSION FRAME

PARAMOUNT BED

PARAMOUNT BED CO., LTD.
14-5 2-CHOME HIGASHISUNA, KOTO-KU, TOKYO 136-8670 JAPAN
TEL +81-3-3648-2961 FAX +81-3-3648-2420
http://www.paramount.co.jp/

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